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CLAIMS:

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1. *Sub B5*

A trim press article handling apparatus, comprising:  
a frame;  
a punch carried by the frame;  
a die carried by the frame and cooperating in relative movement with the punch to sever articles from a web; and  
a treadle carried for movement relative to the die, the treadle including a web guide member, a primary guide strip spaced from the guide member slightly greater than a thickness of the web, a secondary guide strip spaced from the guide member at least four thicknesses of the web and spaced apart from the primary guide strip, and an article detector carried by at least one of the primary guide strip and the secondary guide strip and operative to detect position of an article in the web by detecting the position of a protuberance in the web as the protuberance is conveyed between the primary guide strip and the secondary guide strip.

2. The article handling apparatus of claim 1 further comprising control circuitry communicating with the article detector and a drive motor operative to move the treadle, the control circuitry configured to receive an input signal from the article detector indicative of the position of a web-supported article relative to the punch and the die, and operative to control operation of the drive motor to synchronize

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1 movement of the web-supported article via controlled motion of the  
2 treadle.

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4 3. The article handling apparatus of claim 2 wherein the article  
5 detector comprises an optical emitter and a photodetector, one of the  
6 optical emitter and the photodetector provided on the primary guide strip  
7 and the other provided on the secondary guide strip spaced apart from  
8 the primary guide strip, wherein movement of a protuberance in the web  
9 between the optical emitter and the photodetector generates an output  
10 signal from the photodetector to the control circuitry indicative of the  
11 location of an article relative to the guide plate member.

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13 4. The article handling apparatus of claim 2 wherein the article  
14 detector comprises an optical detector configured to generate a signal  
15 indicative of a change of state when a protuberance is detected with the  
16 optical detector.

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18 5. The article handling apparatus of claim 2 wherein the  
19 protuberance is an article formed in web.

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21 6. The article handling apparatus of claim 2 further comprising  
22 a drive wheel assembly for moving a web and articles, the drive wheel  
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1 assembly comprising a pair of roller feed assemblies provided on opposed  
2 edges of a web.

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4 7. The article handling apparatus of claim 6 wherein each of  
5 the pair of roller feed assemblies provides a servo pick assembly having  
6 a servo motor controllably driven by the control circuitry.

7  
8 8. The article handling apparatus of claim 1 wherein the  
9 primary guide strip and the web guide member depend in a vertical  
10 orientation from the treadle and the punch and the die are supported  
11 for relative movement in a horizontal direction.

12  
13 9. The article handling apparatus of claim 7 wherein a topmost  
14 portion of the primary guide strip is flared away from the web guide  
15 member to accommodate entrance feeding of the web during movement  
16 between the treadle and the frame.

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18 10. The article handling apparatus of claim 1 wherein the web  
19 guide member comprises a web guide plate providing a stripper plate for  
20 a trim press.

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22 11. An article conveying, guiding, and locating device, comprising:  
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1 a treadle including a web guide plate, a guide strip spaced  
2 slightly greater than a thickness of the web from the guide plate;

3 a web conveyor having a servo pick assembly and a servo  
4 helper assembly driven by a servo motor, and configured to move a web  
5 of articles wherein the servo pick assembly is carried by the treadle;

6 an article detector carried by the treadle and operative to  
7 detect location of an article in the web during movement of the web;  
8 and

9 a controller communicating with the drive motors and the  
10 article detector and operative to controllably regulate and synchronize  
11 operation of the servo pick assembly and the servo helper assembly in  
12 response to detected location of the article.

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14 12. The device of claim 11 wherein the motor for the servo pick  
15 assembly comprises a servo motor carried by the treadle.

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17 13. The device of claim 11 wherein the article detector detects  
18 location of an article in the web by optically detecting the location of  
19 a protuberance in the web provided at a known location in the web  
20 relative to an article.

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22 14. The device of claim 11 wherein the web conveyor comprises  
23 a pair of wheels provided along each edge of the web.



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1 19. A method for delivering web-supported articles between dies  
2 and punches of a trim press, comprising:

3 providing a treadle having an article detector;  
4 while moving the web and articles, guiding the web and  
5 articles along the web and between a pair of articles in a row extending  
6 transverse to a travel path direction;

7 detecting location of an article in the web using the article  
8 detector; and

9 in response to detecting the location of the article,  
10 controllably moving the web to position the article between a  
11 corresponding punch and die of the trim press.

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13 20. The method of claim 19 wherein the step of detecting  
14 location comprises optically detecting movement of an article relative to  
15 the article detector.

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17 21. The method of claim 19 wherein the step of detecting  
18 location of an article comprises optically detecting a protuberance in the  
19 web.

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21 22. The method of claim 19 wherein the protuberance is an  
22 article embedded in a web.  
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